इंटरनेट मानक

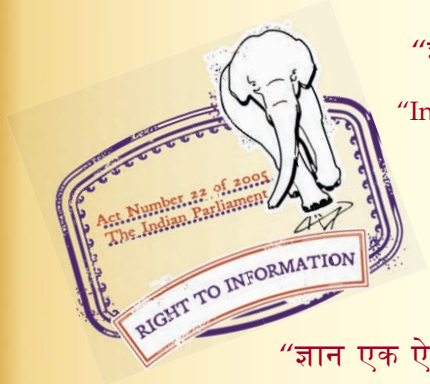
Disclosure to Promote the Right To Information

Whereas the Parliament of India has set out to provide a practical regime of right to information for citizens to secure access to information under the control of public authorities, in order to promote transparency and accountability in the working of every public authority, and whereas the attached publication of the Bureau of Indian Standards is of particular interest to the public, particularly disadvantaged communities and those engaged in the pursuit of education and knowledge, the attached public safety standard is made available to promote the timely dissemination of this information in an accurate manner to the public.

"जानने का अधिकार, जीने का अधिकार"
Mazdoor Kisan Shakti Sangathan
"The Right to Information, The Right to Live"

"पुराने को छोड नये के तरफ"
Jawaharlal Nehru
"Step Out From the Old to the New"

IS 10783 (1983): Patients-Lifting Devices, Mobile, Manually Operated [MHD 12: Hospital Equipment]



"ज्ञान से एक नये भारत का निर्माण"
Satyanarayan Gangaram Pitroda
"Invent a New India Using Knowledge"

"ज्ञान एक ऐसा खजाना है जो कभी चुराया नहीं जा सकता है"
Bhartṛhari—Nītiśatakam
"Knowledge is such a treasure which cannot be stolen"

BLANK PAGE

Indian Standard (Reaffirmed 2001)

SPECIFICATION FOR PATIENT-LIFTING DEVICES, MOBILE, MANUALLY OPERATED

[Ref : Doc : CPDC 14 (1645)]
Hospital Equipment Sectional Committee, CPDC 14; Hospital Furniture Subcommittee, CPDC 14 : 1

1. Scope — Specifies requirements for the mechanical safety aspects of mobile patient-lifting devices and describes the related type tests and the production test for individual devices. In addition the standard makes recommendations for the design, performance and routine maintenance testing.

2. Design

2.1 Patient-lifting devices shall be designed to handle a minimum safe working load of 150 kg.

2.1.1 The safe working load shall be marked on the lifting device in such a position that it can be clearly seen by the operator of the device.

2.1.2 The marking shall be of a permanent nature and shall be such that it can be read at a distance of 600 mm by a person having normal eye sight.

2.2 Where foot controls are provided, particular attention shall be paid to ensuring that they do not disturb the equilibrium of the lifting device.

3. Construction

3.1 *Mast* — The mast of the lifting device shall be so located in relation to the base that it can be assembled only in the correct working position.

3.2 *Base*

3.2.1 Where adjustment of base width is provided, positive stops shall be incorporated so that failure of any component of the adjusting device shall have no effect on the maximum and minimum base width obtainable.

3.2.2 The base width adjusting device shall be such that the base members are locked in the desired position so that there shall be no risk of the base changing should the castor, or castors, meet an obstruction.

3.3 *Jib and Spreader Bar* — Where the design is such that a spreader bar is used to couple the slings to the jib, it shall be secured in such a manner that movement relative to the jib is limited to rotation about the vertical, and the spreader bar remains in the vertical plane for all positions of the jib.

3.4 *Propulsion Handles*

3.4.1 Where propulsion handles are provided, they shall be securely fixed, that is welded or bolted to the mast.

3.4.2 Plastics or rubber grips shall be securely fixed to the propulsion handles.

3.5 *Castors*

3.5.1 Castors shall comply with the requirements of IS : 4034-1979 ' Specifications for castors for hospital equipment (*first revision*) '.

3.5.2 Castors fixings other than for plug-fitting castors, shall be provided with full thread engagement and a thread locking device.

3.5.3 Plug-fitting castors shall not be used unless a positive locking device is included to prevent their accidental detachment.

Adopted 26 December 1983 Gr 3

INDIAN STANDARDS INSTITUTION
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

3.6 *Slings, Harness and Chains*

3.6.1 Where chain is used, it shall be of steel, and it shall be side welded. The load imposed on the chain by the safe working load shall not exceed one-fifth of the breaking load of the chain.

3.6.2 Any hook used for raising or lowering or as a means of suspension either shall be provided with an efficient device to prevent displacement of the load from the hook, or shall be of such a shape as to reduce as far as possible the risk of displacement.

3.6.3 Where metallic loops of a material less than 8 mm diameter form part of the sling, a device shall be provided to prevent accidental displacement of the sling or the loop when in use.

3.6.4 All harness and slings shall be of rot-proof material, for example nylon or terylene.

3.6.5 Stitching shall be carried out with rot-proof thread, for example nylon or terylene.

3.6.6 Riveting of slings or harness shall not be used except to supplement stitching.

3.7 *General*

3.7.1 All threaded fastenings that are likely to work loose in use shall have full thread engagement and shall be fitted with a locking device.

3.7.2 Cap nuts and blind nuts shall not be used unless they are locked to a shoulder or locked with supplementary pins.

3.7.3 Self-tapping screws shall not be used except to secure such items as identification plates, covers and similar light duty items.

3.7.4 Threaded sections shall not be used as a bearing surface as pivoting points.

3.8 *Welding and Brazing*

3.8.1 Welding and brazing shall fully penetrate and shall be sound in every detail and it shall be finished flush. In the finished stage, there shall be no exposed sharp edges in the frame-work or other unsealed formations which may harbour dirt or foreign matter.

3.8.2 Where welding is used, it shall be carried out in accordance with the following Indian Standards as appropriate :

IS : 823-1964 Code of procedure for manual metal arc welding of mild steel,

IS : 2811-1964 Recommendations for manual tungston inert-gas arc welding of stainless steel, and

IS : 2812-1964 Recommendations for manual tungston inert-gas arc-welding of aluminium and aluminium alloys.

4. Finish

4.1 All parts of the lifting device shall be free from sharp edges or projections that could cause a hazard to the user or operator or damage to clothing.

4.2 All surfaces that are likely to corrode shall be protected against corrosion by one of the following methods.

a) Steel components shall be plated chromium over nickel to service Grade No. 3 of IS : 1068-1968 ' Specification for electroplated coatings of nickel and chromium on iron and steel (*first revision*) ', or they shall be finished with an enamel, plastics or powder coating which shall be hardened and shall not readily chip or flake.

b) Small components made of steel, for example nuts, bolts, etc, may be electro-plated in accordance with IS : 1572-1968 ' Specification for electroplated coatings of cadmium on iron and steel (*first revision*) ', and IS : 1573-1970 ' Specification for electro-plated coatings of zinc on iron and steel (*first revision*) '.

c) Aluminium shall be anodized in accordance with IS : 1868-1968 ' Specification for anodic coatings on aluminium (*first revision*) '.

5. Marking

5.1 Each lifting device shall carry a permanent lable marked with the following :

a) Manufacturer's name and initials or recognized trade-mark,
b) Serial number,
c) Date (year and month) of manufacture, and
d) Safe working load.

5.2 For the marking of the safe working load (*see* **2.1.1.** and **2.1.2**).

5.3 Each sling provided for use with the lifting device shall be clearly marked with :

a) Manufacturer's name, initials or recognised trade-mark;
b) Model number, or name of the hoist for which the sling is designed and the safe working load of the sling;
c) Model number, or name of the sling;
d) Size, for example large, medium, small; and
e) Washing and drying instructions.

Note — Relevant symbols similar to those used for clothes may be used.

The method of marking shall be such that it will remain legible after the cleaning/laundering procedures recommended by the manufacturer [*see* (e) above].

5.4 *ISI Certification Marking* — Details available with the Indian Standards Institution.

6. General Tests Requirements

6.1 *Testing for Compliance* — One lifting device representative of each type shall be tested as specified in **7** and it shall comply with the corresponding requirements. Every device shall be tested as specified in **7.2** and it shall comply with the corresponding requirements in **8**.

6.2 *Conditions of Test*

6.2.1 Accuracy of linear measurement shall be ± 2 mm.

6.2.2 Accuracy of load measurement shall be ± 1%.

6.2.3 Accuracy of angle measurement shall be 0·5°.

6.2.4 The rate of application of load shall be such that there is no significant risk of shock.

6.2.5 Tests shall be carried out in an ambient temperature of between 24°C, and 27°C.

6.2.6 Tests shall be carried out on a fully assembled lifting device with accessories such as slings, etc, excepting that, where it is impracticable to carry the required load in the patient-carrying accessories, the load may be imposed directly on the lifting device. Where this procedure is adopted, a separate test at an equivalent load shall be applied to each of the slings and other accessories.

7. Type Tests and Requirements

7.1 *Performance Reliability Test* — A load equivalent to the declared safe working load shall be raised from the lowest to the highest operating position 10 000 times. At the conclusion of the 10 000 operations the lifting device shall comply with the requirements of the test defined in **7.2.**

Note — It is permissible, where more convenient, to carry out this cyclic operation test on the raising and lowering mechanism as a separate assembly provided it is subjected to stresses equal to those to which it would be subjected when assembled in a lifting device carrying the safe working load. In this case the mechanism should be re-assembled in the lifting device before carrying out the test specified in **7.3**.

7.2 *Load Raising and Lowering Test*

7.2.1 The lifting device shall satisfactorily raise a test load equivalent to 125 percent of the safe working load.

The test load shall be raised from the lowest operating position to an upper position defined as follows :

a) If, when the device is in use, raising of the load is effected by changing the angle between the mast and the jib, the upper position shall correspond to the jib's being at an angle of 60° above the horizontal.

b) In all other cases the upper position shall be the highest operating position.

7.2.2 The load, as detailed in **7.2.1**, shall remain at the high position for a period of 15 minutes and during this period it shall not fall from its initial position by more than 3·0 mm.

7.2.3 A load equivalent to the safe working load shall be raised from the lowest operating position to the highest position as defined in **7.2.1**. The maximum force that the operator needs to exert shall be measured and shall not exceed 120 N.

7.2.4 When the safe working load suspended at the highest position, the release device shall be operated and the load allowed to fall to the lowest position. Where the descent rate is not controlled by the direct physical effort of the operator, the rate of fall shall not be more than 108 mm/s.

If a staged or stepped release control is provided, this test shall be carried out with the release device moved to the initial position intended to allow the lowering of a patient.

7.3 *Stability Test*

7.3.1 Stability tests shall be carried out by placing the lifting device carrying the safe working load on an inclinable surface and measuring the angle to which the surface has to be inclined to cause the lifting device to become unstable.

7.3.2 The load shall be so suspended on the lifting device that the distance between the centre of gravity of the load and the highest point on the lifting device at which the system of suspension allows rotation about the vertical axis is 650 mm.

7.3.3 The position of the spreader bar/jib and attachments and the setting of the base width, where this is adjustable, shall be such as to cause maximum tendency for the lifting device to overturn when the surface is tilted. Where the jib is set at maximum height to achieve minimum stability, the height shall be as defined in **7.2.1**.

7.3.4 The test shall be carried out with the lifting device in each of the four positions indicated in Fig. 1 (a), (b), (c) and (d) and with the respective pair of castors prevented from movement by a suitable locking device.

7.3.5 The angle of inclination of the surface at which instability occurs shall be measured and it shall not be less than the following values:

a) With the plane of the longitudinal axis of the jib approximately parallel to the axis about which the supporting surface is to be inclined the angle shall be 5° [*see* Fig. 1 (a) and (b)].

b) With the plane of the longitudinal axis of the jib approximately normal to the axis about which the supporting surface is to be inclined and with the mast at the lower end of the surface, the angle shall be 10° [*see* Fig. 1 (c)].

c) With the plane of the longitudinal axis of the jib approximately normal to the axis about which the supporting surface is to be inclined and with the mast at the higher and of the surface the angle shall be 5° [*see* Fig. 1 (d)].

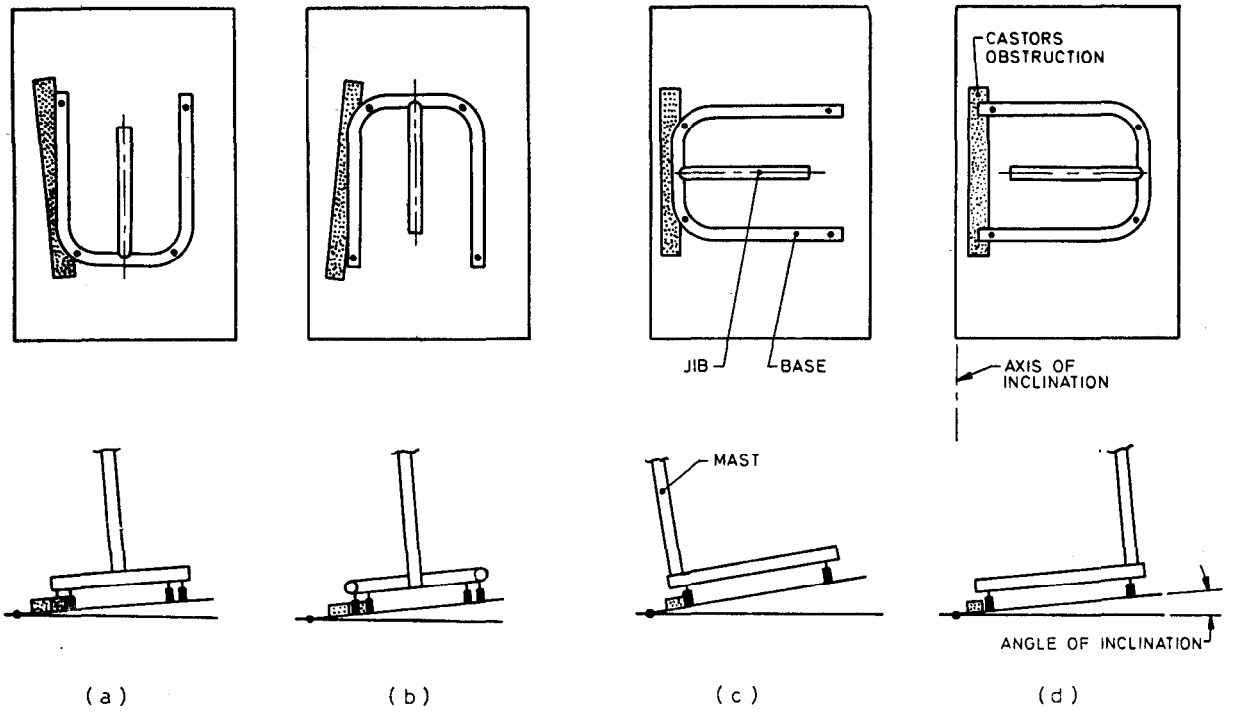


FIG. 1 POSITIONS FOR STABILITY TESTS

7.4 *Tests for Structural Strength*

7.4.1 *Preliminary static loading* — In preparation by static load testing, a load equivalent to the safe working load shall be applied to the lifting device 100 000 times. Where the raising of the load in normal operation is effected by changing the angle between the jib and the mast, the cyclic loading shall be carried out with the major axis of the jib horizontal. Where the angle between the jib and the mast is not changed when raising the load in normal operation, the cyclic loading shall be carried out with the jib at maximum height.

7.4.2 *Static Load Test* — A static load shall be applied incrementally to the device with the jib in the same position as in **7.4.1** until collapse occurs. The load at this point shall be not less than 2·5 times the declared safe working load.

7.5 *Static Load Tests for Load-Bearing Accessories* — The tests detailed in **7.4** shall be applied to all load-bearing accessories provided for use with the lifting device.

8. Production Tests and Requirements

8.1 After manufacture each lifting device and its accessories shall be subjected to the tests specified in **7.2**.

8.2 The manufacturer shall provide with each lifting device a certificate confiming that the tests have been carried out. The certificate shall carry the serial number of the lifting device and the date of testing.

9. Servicing Facilities and Maintenance Testing

9.1 *Preliminary* — This clause specifies requirements regarding information on the servicing and spares to be provided by the manufacturer. It also includes recommendations on the tests to be carried out in connection with routine maintenance and repair procedures.

9.2 *Documentation*

9.2.1 In addition to the certificate called for in **8.2** the manufacturer shall supply with each lifting device one copy of the operating and maintenance instructions, including details of the routine inspection tests that are required at regular intervals to ensure a satisfactory standards of safety and efficient operation.

9.2.2 The following information shall be available from the manufacturer on request :

a) Parts lists covering all items, and
b) Details of any inspection and servicing arrangements that the manufacturer is prepared to offer.

9.3 *Routine Testing* — It is recommended that tests, as defined in **7.2** of this specification, should be carried out at regular intervals of not more than 12 months and, additionally, whenever major overhaul, repair or modification of the lifting device has taken place.

EXPLANATORY NOTE

In the preparation of this standard considerable assistance has been derived from BS 5827-1979 'Specification for patient-lifting device, manually operated'; issued by the British Standards Institution, U.K.

Printed at Printrade, New Delhi, India